

SYSTEM-JUSTIFYING BELIEFS MODERATE THE RELATIONSHIP BETWEEN PERCEIVED DISCRIMINATION AND RESTING BLOOD PRESSURE

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Perceiving discrimination is a chronic stressor that may negatively impact health. We predicted that the relationship between chronic perceptions of discrimination and chronic stress, as indexed by resting blood pressure, would be moderated by individual differences in system-justifying beliefs (SJBs), specifically the extent to which people believe that success is determined by hard work. We reasoned that people who strongly endorse SJBs would find discrimination to be especially stressful because it both violates their expectations about the world and impedes their motivation to justify the system. In two studies, we measured White women's self-reported SJBs and perceptions of personal discrimination based on gender. We later measured their resting blood pressure. The relationship between perceived discrimination and blood pressure was positive and significant for women who strongly endorsed SJBs, but nonsignificant for women who did not endorse SJBs. Implications for Worldview Verification Theory and System Justification Theory are discussed.

Discrimination against members of devalued groups, both actual and perceived, is thought to be a significant source of stress that contributes to health disparities between members of advantaged and disadvantaged groups (Clark, Anderson, Clark, & Williams, 1999; Mays, Cochran, & Barnes, 2007; Shavers & Shavers 2006; Williams, Yu, Jackson, & Anderson, 1997). Members of disadvantaged groups vary widely, however, both in the extent to which they perceive themselves to be targets of discrimination and in how they respond to perceived discrimination that

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is directed against themselves or their social group (see Major & O'Brien, 2005, for a review). A growing body of research suggests that people's ideologies or worldviews regarding the basis and legitimacy of the status system are an important determinant of their responses to disadvantage and discrimination (e.g., Major et al., 2002; Major, Kaiser, O'Brien, & McCoy, 2007). The current research tests the hypothesis that individual differences in the endorsement of system-justifying beliefs moderate the relationship between perceived discrimination and resting blood pressure, which is an index of physical well-being related to stress. We hypothesized that because discrimination poses a threat to the perceived fairness of the system, the perception that oneself (or one's group) is a target of discrimination will be more stressful for people who believe that status is deserved (based on effort) than for those who reject this belief.

PERCEIVED DISCRIMINATION AS A STRESSOR

Discrimination imposes objective hardships on its targets, limiting their access to jobs, housing, healthcare, and education, among other things (Crandall & Eshleman, 2003; Sidanius & Pratto, 1999). Discrimination also imposes psychological hardships, threatening targets' personal identity, social identity, and worldviews (Jost & Hunyady, 2002; Leary & Baumeister, 2000; Pyszczynski, Greenberg, & Solomon, 1997; Tajfel & Turner, 1986; Tesser, 1988). A number of theories provide explanations for why discrimination may be psychologically stressful. Ego and group justification theories predict that discrimination undermines individuals' need to feel good about themselves and about the groups to which they belong (Jost, Burgess, & Mosso, 2001; Tajfel & Turner, 1986; Tesser, 1988). Sociometer theory suggests that discrimination is a form of social rejection that violates people's need to feel accepted and valued by others (Leary & Baumeister, 2000). Finally, system justification theory suggests that discrimination is stressful because it undermines the need to view the current social and political system as fair and just (Jost & Banaji, 1994; Jost & Hunyady, 2002; cf. Lerner, 1980). In short, there are multiple reasons why one would expect perceived discrimination against the self to be associated with increased stress.

Some scholars have argued that chronic stress experienced as a result of repeated exposure to discrimination contributes to well-documented health disparities between members of high status and low status groups in society (Clark et al., 1999; Mays et al., 2007; Shavers & Shavers, 2006; Williams et al., 1997). Exposure to chronic stress may lead to excess wear and tear on the body, which increases risk for illness (McEwen, 2000).

Research has frequently demonstrated a positive association between perceived discrimination and mental health problems (Banks, Kohn-Wood, & Spencer, 2006; Crouter, Davis, Updegraff, Delgado, & Fortner, 2006; Klonoff, Landrine, & Campbell, 2000; Lam, 2007; Noh, Kaspar, & Wickrama, 2007). Research has also demonstrated a positive association between discrimination and physical health problems. Perceived discrimination is associated with higher reports of physical ailments, such as headaches and gastrointestinal problems, along with a higher incidence of breast cancer, coronary artery calcification, and giving birth to babies who are low in weight (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006; Collins et al., 2000; Landrine, Klonoff, Gibbs, Manning, & Lund, 1995; Taylor et al., 2007).

Recently, researchers have attempted to more directly investigate the relationship between perceived discrimination and health by measuring physiological variables thought to be affected by psychosocial stressors, such as blood pressure (BP; see Williams & Mohammed, 2009, for a review). Some studies have examined the effects of perceived discrimination on acute stress responses by examining changes in BP as a function of exposure to discrimination in the laboratory. Overall, these studies suggest that discrimination manipulated in a laboratory environment leads to increased reactivity of cardiovascular measures like BP (Lepore et al., 2006; McNeily et al., 1996; Richman, Bennett, Pek, Siegler, & Williams, 2007; Williams & Mohammed, 2009).

Other studies have investigated the relationship between perceived discrimination and physiological indicators of exposure to chronic stress (Clark, 2006; Peters, Benkert, Dinardo, & Templin, 2007; Ryan, Gee, & Laflamme, 2006). Measures of cardiovascular function at rest, including BP, are thought to be related to chronic stress (McEwen, 2004). Elevated resting BP is also a known risk factor for cardiovascular disease (Stamler, Neaton, & Wentworth, 1989). Thus, resting BP may be an important indicator of stress related to physical well-being. Research examining the relationship between perceived discrimination and resting BP, however, has yielded mixed results. Some studies show a direct positive relationship between perceived discrimination and resting BP (e.g., Peters et al., 2007), but many do not (e.g., Brown, Matthews, Bromberger, & Chang, 2006; Clark, 2006; Matthews, Salomon, Kenyon, & Zhou, 2005; Peters, 2006). The latter studies either demonstrate that there is no relationship between perceived discrimination and blood pressure (Brown et al., 2006; Peters, 2006), or that the relationship is moderated by a third variable (Clark, 2006; Matthews et al., 2005; Williams & Mohammed, 2009). A recent review of this literature concluded that the effects of perceived discrimination on BP are largely conditional, meaning that they are present for some sub-groups but not others (Williams & Mohammed, 2009). There is a growing recognition among researchers in this field that personal and situational factors must be explored to gain a more complete understanding of how discrimination influences health (Brondolo, Brady ver Halen, Pencille, Beatty, & Contrada, 2009; Williams & Mohammed, 2009).

SYSTEM-JUSTIFYING BELIEFS

We propose that people's beliefs about the basis and legitimacy of the status system are an important moderator of the link between perceived discrimination and stress responses. Status-related beliefs are part of an individual's worldview; they provide a meaningful description of, and explanation for, status differences that exist in society and describe the standards that are necessary to be a person of social and material value (e.g., Major et al., 2007). Status beliefs are typically shared within a cultural context (Kluegel & Smith, 1986; Shweder, 1995). Furthermore, status beliefs that are dominant within a culture are often system justifying (Jost & Hunyady, 2005; Jost & Thompson, 2000; Sidanius & Pratto, 1999). That is, they serve to preserve a view of existing social and political arrangements in society as fair and just (Crandall, 1994; Jost & Hunyady, 2002; Major et al., 2002; Major et al., 2007).

In Western cultural contexts, the dominant status ideology is meritocracy—the belief that success is based on hard work and/or merit. Meritocracy is

commonly measured and conceptualized in terms of people's endorsement of beliefs such as the Protestant work ethic (Katz & Hass, 1988), which links advancement in society to hard work, and the belief in individual mobility (Major et al., 2002), which maintains that any individual can get ahead, regardless of group membership. These beliefs justify status inequalities by holding people responsible for their station in life and locating the cause of their outcomes within their own efforts or merits. Hence, meritocracy implies that those who are higher status in society are more deserving than those who are lower status because people of higher status worked harder or are more capable (see also Ledgerwood, Jost, Mandisodza, & Pohl, 2011).

Numerous scholars have pointed out that unequal status systems cannot persist without widespread endorsement of beliefs that justify those systems, especially among people who are disadvantaged within the system (Jackman, 1994; Jost & Banaji, 1994; Jost & Hunyady, 2002). According to System Justification Theory (SJT), people endorse system-justifying beliefs (SJBs), such as meritocratic beliefs, in part because of a fundamental motive to preserve the belief that existing social arrangements are fair, legitimate, and justifiable (Jost & Hunyady, 2005; Jost, Pelham, Sheldon, & Sullivan, 2003). Believing in a fair system is thought to impart a sense of certainty, meaning, and control (Jost et al., 2003; Kluegel & Smith, 1986; Wakslak, Jost, Tyler, & Chen, 2007). Consequently, SJT predicts that events that challenge the legitimacy of the system are distressing and motivate attempts to bolster or restore the perceived fairness of the system (e.g., Jost & Hunyady, 2002). Because perceiving oneself or one's ingroup to be a victim of discrimination requires acknowledging that the system as it applies to the self is unfair, SJT leads to the prediction that perceiving discrimination against the self should be experienced as stressful.

Despite the generally shared nature of SJBs, there is substantial evidence that people differ in the extent to which they endorse them. In the United States, for example, people differ in their strength of endorsement of meritocracy-related beliefs such as the Protestant work ethic and the belief in individual mobility (Kluegel & Smith, 1986; Levin, Sidanius, Rabinowitz, & Federico, 1998). Furthermore, individual differences in endorsement of these beliefs moderate both perceptions of and responses to prejudice. For example, the more that members of disadvantaged groups (e.g., Latinos, Blacks, and women) endorse the belief in individual mobility or believe that success is based on hard work, the less likely they are to see their ethnic or gender group as a victim of discrimination (Major et al., 2002), the less likely they are to attribute rejection by a member of a higher status group to discrimination (Major et al., 2002), and the less likely they are to devalue the importance of domains in which their group is disadvantaged (Schmader, Major, Eccleston, & McCoy, 2001). Jost and colleagues have suggested that differences in strength of endorsement of SJBs reflect differences in tendencies to justify the system (Jost & Burgess, 2000; Jost et al., 2001; Jost & Hunyady, 2005). These differences in tendencies to engage in system justification presumably reflect differences in the motivation to do so. Thus, to the extent that those who more strongly endorse SJBs are more motivated to justify the system, they should be more threatened by injustice or discrimination than those who endorse them less strongly.

Major and colleagues (2007) suggest that differential endorsement of SJBs reflect differences in the content of individuals' worldviews. From their perspective, because individuals' beliefs about status are a product of their unique sociocultural

environment, reference groups, and personal experiences, personal ideologies may differ from the ideology that is dominant within the culture as a whole. Drawing from self-verification and dissonance theories, Major et al. (2007) proposed Worldview Verification Theory (WVT), which posits that because worldviews are a source of predictability, meaning, and control, people are motivated to verify or confirm their worldview. When their worldview is violated, they experience feelings of anxiety and stress (Janoff-Bulman, 1989; Major et al., 2007). Hence, WVT predicts that the more strongly a person endorses SJBs, the more he or she will experience discrimination as stressful because discrimination is inconsistent with his or her worldview. Furthermore, the strong prediction from this theory is that the less a person endorses SJBs the more he or she will perceive the absence of discrimination to be stressful (at least initially) because it is inconsistent with his or her worldview.

Both SJT and WVT lead to the prediction that individual differences in endorsement of SJBs will moderate the stressfulness of perceiving the self as a victim of discrimination. Both theories suggest that those who more strongly endorse beliefs that justify the legitimacy of the system will be more stressed by discrimination than those who endorse them less strongly (Jost, Pietrzak, Liviatan, Mandisodza, & Napier, 2008; Major et al., 2007). SJT suggests this will occur because discrimination impedes the former's greater need to see the system as fair. WVT suggests it will occur because discrimination violates the former's worldview. People who do not endorse SJBs may not experience as much stress in response to discrimination because they have a weaker need to justify the system, according to SJT, or because discrimination confirms their worldview, according to WVT. It is likely that people have both a motive to justify the system and a motive to confirm their worldview. Thus, discrimination may be highly stressful for people who strongly endorse SJBs because it impedes two key motives—system justification and worldview verification. Discrimination may be less stressful for people who do not endorse SJBs because it only impedes their weak motive to justify the system and because it does not impede their motive to confirm their worldview.

Several recent studies demonstrated that individual differences in endorsement of SJBs moderate the association between perceived discrimination and self-esteem (Major et al., 2007), and perceived discrimination and cardiovascular reactivity (Townsend, Major, Sawyer, & Mendes, 2010). For example, members of ethnic minority groups who strongly endorsed the belief in individual mobility and the belief that success is based on hard work reported lower self-esteem the more discrimination they perceived against their group, while individuals who rejected these beliefs reported higher self-esteem the more they perceived discrimination against their group (Major et al., 2007; Study 1). Other research showed that Latina and White women who endorsed SJBs (belief in individual mobility and belief in status legitimacy) responded to a high status group member who expressed prejudice against their group with maladaptive cardiovascular responses (associated with a threat response) during an interaction. In contrast, Latina and white women who rejected SJBs exhibited more maladaptive cardiovascular responses when a high status group member did not express prejudice (Townsend et al., 2010). These recent studies are supportive of predictions from WVT, in that participants who endorsed SJBs showed lower self-esteem and more maladaptive cardiovascular responses when exposed to evidence that prejudice against their group was present or pervasive vs. absent or rare.

Although these studies give some insight into how endorsement of SJBs might moderate the relationship between discrimination and stress, they focus on responses to an acute discriminatory stressor. In the current research, we examined whether individual differences in endorsement of SJBs would moderate the relationship between chronic perceptions of personal discrimination and resting BP. High resting BP is a risk factor for hypertension and cardiovascular disease and may indicate a chronically high stress level.

There are several reasons why discrimination may be chronically stressful for those who strongly endorse SJBs. First, they may repeatedly encounter stress-inducing worldview and system threats. Second, they may experience more uncertainty when interpreting situations and making decisions because their inconsistent attitudes about system fairness and discrimination guide their cognitions in opposing directions (Fazio, Blascovich, & Driscoll, 1992). Finally, they may engage in cognitively depleting attempts to bolster their worldview or the system after frequent threats, leaving them with fewer resources to deal with other stressors (Haines & Jost, 2000; Jost, 2001; McCoy & Major, 2007).

CURRENT RESEARCH AND PREDICTIONS

Our research is the first to explore the moderating impact of system-justifying beliefs on the relationship between perceived discrimination and resting BP, a physiological measure thought to be related to chronic stress. To examine this issue, we measured White women's endorsement of SJBs (the belief that success is based on hard work) and their perceptions of having been personally discriminated against based on their gender. Several weeks later we measured their resting BP. We predicted that there would be a positive relationship between perceived discrimination and resting BP among participants who strongly endorse SJBs, and no relationship for those who endorse them less strongly. Note that based on previous research (Major et al., 2007), one could predict a negative relationship between perceived discrimination and resting BP among individuals who reject SJBs insofar as perceived discrimination confirms rather than violates their worldview and hence their expectations. However, unlike BP reactivity, resting BP is thought to measure exposure to more chronic stressors. There is little doubt that the objective life outcomes of those who experience little discrimination are better than the objective life outcomes of those who experience a great deal of discrimination. Perceptions of discrimination do reflect objective experiences, albeit imperfectly. Even though perceiving discrimination as rare is inconsistent with the beliefs of those who reject SJBs, the initial stress induced by a worldview contradiction might be outweighed by positive social interactions (or the absence of negative interactions). For example, if a person who believes that discrimination will prevent her from getting ahead receives a lucrative promotion at work she may be distressed by the worldview violation initially, but she will still reap the financial and social benefits of a higher status job. Furthermore, although the absence of discrimination may violate the worldview of those who reject SJBs, it will still satisfy their system justification motive. Thus, the stress induced by the worldview violation of rare discrimination may be partially outweighed by the palliative effect of system justification. Accordingly, we predict that perceived discrimination will be positively related to resting BP among individuals who strongly endorse SJBs, but unrelated to BP among individuals who do not have a strong belief that success is based on hard work.

STUDY 1

METHOD

Participants and Overview

Eighty-nine self-identified White women ranging in age from 18 to 24 years ($M = 18.87$, $SD = 1.20$) completed a measure of perceived personal discrimination based on gender and a measure of system-justifying beliefs (SJBs) as part of a larger online departmental prescreening session. To control for potentially confounding variables, participants also completed a measure of general anxiety. Several weeks later, participants were scheduled individually for a laboratory session in which resting blood pressure was assessed.

Measures

BP was recorded during a 5-minute baseline period. BP changes stem from blood flowing from the heart and/or resistance in the arteries and are measured at two points: systole, the point at which the force exerted by the blood on artery walls is greatest (systolic blood pressure; SBP), and diastole, the point at which the blood exerts the least force on the artery walls (diastolic blood pressure; DBP). We used a Vasotrac noninvasive monitor (model APM205A), which recorded SBP and DBP from the radial artery of participants' nondominant arm approximately every 15 seconds. We measured the distance of the radial blood pressure cuff from the heart for each participant. BP readings are typically measured at the level of the heart. However, because we used a radial blood pressure cuff we instead measured the distance from the cuff to the heart and used that measure as a covariate in analyses. Mean SBP and DBP were calculated for each minute and these were then averaged to produce mean resting SBP and DBP values for each individual. The last minute of baseline was excluded from the mean baseline measure because BP tends to increase as participants anticipate the beginning of a new task. Results are consistent, across both studies, when individual minutes are analyzed separately. Outliers (values greater than 2.6 standard deviations from the overall mean) were assigned a new value equal to 1% larger than the next highest value (e.g., Tabachnick & Fidell, 2001).

Perceived personal discrimination (PPD; $M = 3.02$, $SD = 1.29$) due to gender was assessed with three items. Participants indicated the degree to which they agreed with the following three statements: "I experience discrimination because of my gender," "Gender discrimination will affect many areas of my life," and "Gender discrimination will have a severe impact on my life," on a scale from 0 (completely disagree) to 6 (completely agree) ($\alpha = .79$).¹

1. We used a measure of perceived discrimination that included expectations about discrimination in the future because greater current experiences of discrimination are likely to increase expectations of discrimination. Likewise, expectations about future discrimination are likely to increase perceptions of current discrimination. Consistently, the items on our perceived discrimination scale that measure expectations of future discrimination form a highly reliable scale when combined with the item that measures current experiences of discrimination.

Endorsement of SJBs was measured using four items that assessed beliefs about the link between success and effort, adapted from Levin et al. (1998). Participants indicated their endorsement of the following items on a scale from 0 (completely disagree) to 6 (completely agree): "If people work hard they almost always get what they want," "If people work hard enough, they can be whatever they want to be in life," "Getting ahead in life doesn't always depend on hard work" (reverse-scored), and "Even if people work hard, they don't always get ahead" (reverse-scored; $M = 2.59$, $SD = 0.96$, $\alpha = .74$).

We also assessed general anxiety as a covariate because self-reported anxiety has been shown to relate to BP (Räikkönen, Matthews, Flory, Owens, & Gump, 1999), as well as to perceived discrimination (Banks et al., 2006; Klonoff et al., 2000). Thus, it is important to control for anxiety to rule out the possibility that the relationship found between blood pressure and perceived discrimination might be due to their shared relationship with anxiety. General anxiety was measured with five items from the Brief Symptom Index (Derogatis & Spencer, 1982). Participants were asked to indicate how often they experience "nervousness or shakiness inside," "suddenly scared for no reason," "feeling fearful," "feeling tense or keyed up," and "spells of terror or panic," on a 0 (never) to 4 (all the time) scale ($M = .94$, $SD = 0.70$, $\alpha = .80$).

Procedure

Participants were scheduled to arrive at the laboratory several weeks after completing the above measures. When they arrived at the laboratory, they waited outside with a White male who they believed was also taking part in the experiment. An experimenter then escorted the participant and confederate to separate rooms. The participant learned that the study would take the form of a job interview situation and provided informed consent. BP recording sensors were then applied and participants were asked to sit quietly for a five minute baseline measurement period, which constituted our measure of resting BP. Following baseline, participants took part in an interaction study that is reported elsewhere (Townsend et al., 2010).

RESULTS

We conducted linear regression analyses to test our hypothesis that endorsement of SJBs would interact with perceived personal discrimination (PPD) to predict systolic blood pressure (SBP) and diastolic blood pressure (DBP). In initial analyses, centered general anxiety and distance from heart to blood pressure cuff were entered as covariates, but they were not significant covariates so were therefore excluded from the final analyses. Thus, in Step 1, we entered centered PPD and SJB and in Step 2 we entered the interaction of PPD and SJB.

Systolic Blood Pressure

Consistent with other recent studies, the relationship between PPD and SBP was not significant in Step 1 ($\beta = .089$, $p = .41$), nor was the relationship between SJB and SBP ($\beta = .088$, $p = .42$), $F(2, 87) = 0.57$, $R^2 = .013$, $p = .57$. As predicted, however,

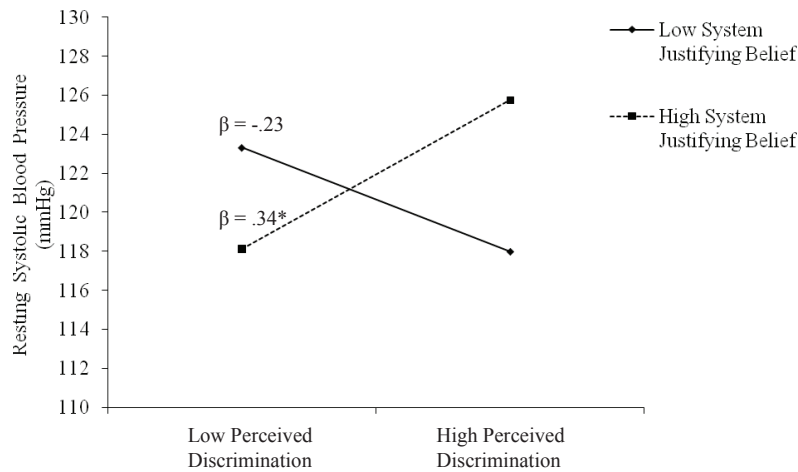


FIGURE 1. Interaction of perceived personal discrimination and system-justifying belief endorsement on resting systolic blood pressure in Study 1.

the interaction term in Step 2 was significant $F(1, 86) = 5.89, \Delta R^2 = .063, p = .017$. To interpret the interaction, we plotted the simple slopes one standard deviation above (3.48) and below (1.59) the mean endorsement of SJBs (see Figure 1). Among women who strongly endorsed the belief that success is due to effort, the more personal discrimination they perceived, the higher their resting SBP, $\beta = .34, t(85) = 2.30, p = .024$. Among women who less strongly endorsed this belief, perceived discrimination was negatively but not significantly related to baseline SBP, $\beta = -.23, t(85) = -1.38, p = .17$.

Diastolic Blood Pressure

We observed a similar pattern for DBP. Neither PPD ($\beta = .13, p = .25$) nor SJB ($\beta = .083, p = .45$) was a significant predictor of DBP in Step 1, $F(2, 87) = 0.82, R^2 = .019, p = .44$. As predicted, the interaction of PPD and SJB in Step 2 was significant, and it explained an additional 5% of the variance in baseline DBP, $F(1, 86) = 4.61, p = .035$. Plotting the simple slopes at one standard deviation above and below the mean of the SJB scale revealed a pattern that was consistent with our hypotheses (see Figure 2). Among women who strongly endorsed the belief that success is due to hard work, perceived discrimination was positively and significantly related to baseline DBP, $\beta = .35, t(85) = 2.34, p = .022$. Among women who did not endorse this belief, perceived discrimination was negatively but not significantly related to baseline DBP, $\beta = -.16, t(85) = -0.95, p = .34$.

DISCUSSION

As predicted, Study 1 showed that the relationship between perceived personal discrimination and resting BP was moderated by individual differences in system-justifying beliefs. Women who strongly endorsed the system-justifying belief that success is due to effort had higher BP (both systolic and diastolic) the more

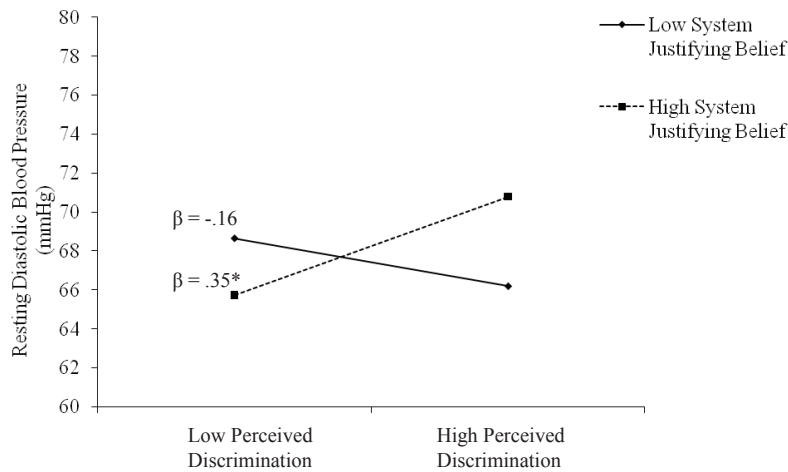


FIGURE 2. Interaction of perceived personal discrimination and system-justifying belief endorsement on resting diastolic blood pressure in Study 1.

they believed they were personally discriminated against because of their gender. In contrast, perceived discrimination was unrelated to resting BP among women who did not endorse this system-justifying belief. These results suggest that perceiving discrimination is a chronic stressor for women who accept the notion that success is due to effort. Both maintaining a belief in a fair system, and maintaining the consistency of one's worldview are posited to give people a sense of certainty and control. For women who strongly endorse system-justifying beliefs, the perception that they are victims of discrimination is stressful because it directly violates both their need to see the system as fair and their personal worldview or ideology. Perceived discrimination may be less stressful for those who reject SJBs because they have a weaker need to believe in a fair system and because evidence of discrimination does not violate the content of their worldview.

One limitation of our first study was that women waited outside the laboratory with a man who they thought was a participant. It is possible that the mere presence of a male participant may have primed gender relations and an intergroup situation. This situation might have elevated the blood pressure of participants who experienced discrimination in the past and who therefore anticipated the possibility of discrimination during the experiment. Although we think this is unlikely, we conducted a second study in which participants met only with a female experimenter in order to rule out this explanation.

STUDY 2

METHOD

Participants and Procedure

Fifty-two self-identified White women ranging in age from 18 to 23 years ($M = 18.96$, $SD = 1.15$) were recruited to participate. All participants completed the same

measures of PPD, SJBs, and general anxiety as part of an online departmental pre-screening session that took place several weeks prior to their scheduled experimental session.

Upon arrival at the laboratory, participants were escorted to a private room by a female experimenter, where they were told that the study concerned physiological responses to communication and cognitive tasks. A BP sensor was applied, and participants were asked to sit quietly for a five minute baseline measurement period. Following this baseline period, participants took part in an experimental session, the results of which are reported elsewhere (Eliezer, Major, & Mendes, 2010).

Materials

PPD ($M = 2.74$, $SD = 1.37$), endorsement of SJBs ($M = 2.50$, $SD = 1.00$), and general anxiety ($M = .86$, $SD = 0.64$) all demonstrated acceptable reliabilities with this sample ($\alpha = .84$, $\alpha = .73$, and $\alpha = .80$, respectively). BP was assessed in the same way and using the same equipment described in Study 1.

RESULTS

We ran linear regression analyses to test the effect of PPD, SJB, and their interaction on mean baseline SBP and DBP values. In Step 1, we entered participants' centered general anxiety score and distance from heart to blood pressure cuff as covariates. Because these covariates were significant we kept them in the analyses. In Step 2, we entered centered PPD and SJB, and the interaction of PPD and SJB was entered in Step 3.

Systolic Blood Pressure

For SBP, there was a significant effect of both general anxiety ($\beta = -.33$, $p = .013$) and distance from heart to blood pressure cuff ($\beta = .30$, $p = .023$) in Step 1, $F(2, 51) = 5.83$, $R^2 = .186$, $p = .005$. Entering centered PPD and SJB in Step 2 did not significantly explain additional variance in SBP, $F(2, 49) = 0.22$, $\Delta R^2 = .007$, $p = .80$ (PPD, $\beta = .10$, $p = .51$; SJB, $\beta = .032$, $p = .83$). In Step 3, the interaction between PPD and SJB explained an additional 8.9% of the variance in baseline SBP, $F(1, 48) = 5.95$, $p = .018$, $\Delta R^2 = .089$. To explore the nature of the interaction, we plotted the simple slopes of perceived personal discrimination at one standard deviation above (3.56) and below (1.62) the mean of the SJB scale (see Figure 3). For women who strongly endorsed SJBs, there was a positive and significant association between perceived personal discrimination and baseline SBP, $\beta = .41$, $t(47) = 2.18$, $p = .034$. This relationship was negative but not significant among women who did not strongly endorse SJBs, $\beta = -.19$, $t(47) = -1.04$, $p = .30$.

Diastolic Blood Pressure

A similar pattern emerged for DBP. The regression equation in Step 1 was significant, $F(2, 51) = 3.230$, $R^2 = .114$, $p = .045$; distance from heart to blood pressure cuff was positively related to baseline DBP ($\beta = .31$, $p = .023$), but general anxiety was

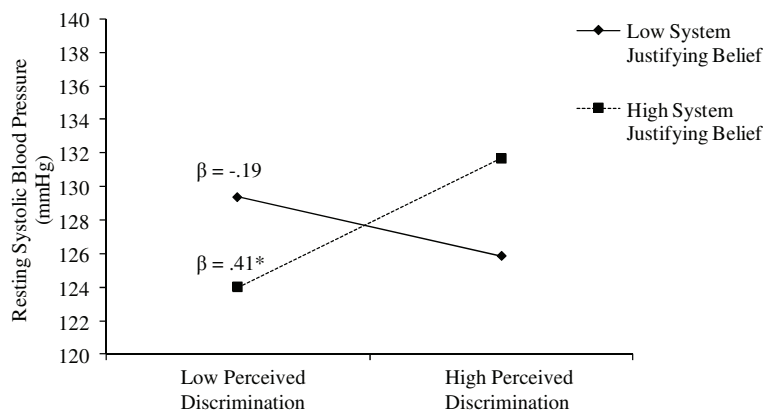


FIGURE 3. Interaction of perceived personal discrimination and system-justifying belief endorsement on resting systolic blood pressure, adjusting for general anxiety and distance from heart to blood pressure cuff in Study 2.

unrelated to DBP ($\beta = -.15, p = .27$). In Step 2, centered PPD and SJB were unrelated to DBP, $F(2, 49) = 1.12, \Delta R^2 = .04, p = .34$. In Step 3, the introduction of the interaction term explained an additional 6.3% of the variance in baseline DBP, $F(1, 48) = 3.87, p = .055, \Delta R^2 = .063$. Exploration of the simple slopes one standard deviation above and below the mean of SJB revealed that among women who strongly endorsed SJBs, greater perceived personal discrimination predicted marginally higher resting diastolic blood pressure, $\beta = .36, t(47) = 1.85, p = .071$. For women who less strongly endorsed this belief, perceived discrimination was unrelated to resting DBP, $\beta = -.14, t(47) = -0.75, p = .46$, (see Figure 4).

DISCUSSION

Study 2 replicated the results of Study 1 without priming an intergroup situation. Once again, we found that individual differences in system-justifying beliefs influenced the relationship between perceived discrimination and resting blood pressure. Women who strongly endorsed SJBs exhibited higher resting blood pressure the more discrimination they perceived based on their gender. In contrast, women who did not strongly endorse SJBs exhibited no relationship between perceived discrimination and resting blood pressure. Study 2 provides further support for our hypothesis that perceived discrimination is a stressor for people who strongly believe that status differences in society are fair and legitimate.

GENERAL DISCUSSION

Across two studies, we observed a positive and significant correlation between perceived discrimination based on gender and resting BP, but only among women who strongly endorsed the system-justifying belief that success is based on hard work. In contrast, perceived discrimination was unrelated to resting BP among women who did not endorse this belief. This pattern of results was observed when

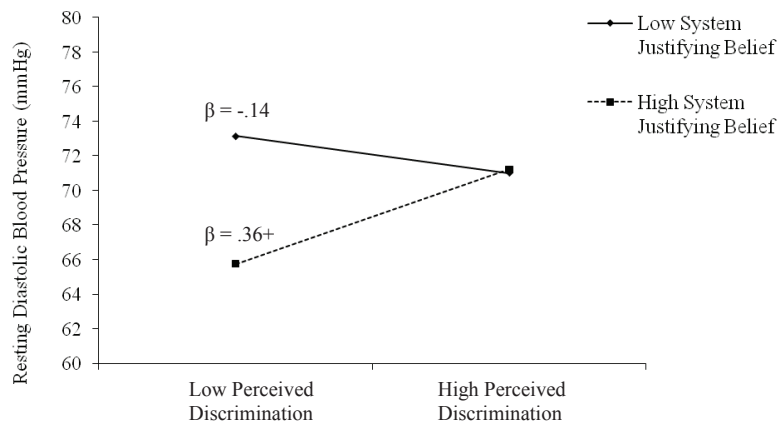


FIGURE 4. Interaction of perceived personal discrimination and system-justifying belief endorsement on resting diastolic blood pressure, adjusting for general anxiety and distance from heart to blood pressure cuff in Study 2.

gender was salient (Study 1) and when it was not (Study 2). These findings are consistent with the argument that discrimination is a significant stressor that may damage physical health, but suggests that the threat is greater for individuals who believe in the fairness of the system (see also Jost & Thompson, 2000).

Discrimination is not only damaging because it conveys one's disadvantaged status, but also because it demonstrates that broader society is unjust. Unfair treatment based on one's group membership communicates the unpleasant reality that one may be residing in an unfair and corrupt system. Although people sometimes respond to the system threat of discrimination by justifying the system; for example, by endorsing stereotypes about low status groups (Jackman, 1994; Jost & Banaji, 1994; Napier, Mandisodza, Andersen, & Jost, 2006), individuals may be unable to deny discrimination when the evidence is direct and personal. According to Worldview Verification Theory and System Justification Theory, when individuals who are motivated to justify the system are consistently unable to do so, they may experience a high level of uncertainty, anxiety, and stress (Jost et al., 2008; Major et al., 2007). These feelings of uncertainty, anxiety, and stress may not only hamper their psychological health (Major et al., 2007), but also their physical health (Townsend et al., 2010).

SJT and WVT provide different explanations regarding why discrimination may be especially stressful for people who strongly endorse SJBs. According to SJT, people who strongly endorse SJBs have an especially strong motivation to view the system as fair and just (Jost & Burgess, 2000; Jost et al., 2001; Jost & Hunyady, 2005). Hence, discrimination should be most stressful for those who strongly endorse SJBs, because it impedes their powerful motive to justify the system. In contrast, those who do not endorse SJBs may experience less stress in response to discrimination because they have a weaker motive to justify the system. WVT proposes that discrimination is especially stressful for people who strongly endorse SJBs because it violates their worldview. In contrast, discrimination may be less stressful for those who reject SJBs because it validates their worldview.

Thus, although SJT and WVT focus on different core motives (i.e., system justification and worldview verification), both theories make similar predictions regarding how endorsement of SJBs will moderate responses to discrimination. Based on the extant literature, it seems likely that people are motivated both to justify the system and to confirm their worldviews. For people who strongly endorse SJBs, discrimination poses a threat to both motives. In contrast, for people who reject SJBs, discrimination only poses a threat to their relatively weak system justification motive. For these people, the anxiety-inducing effects of system threat may be mild and offset by the anxiety-reducing effects of worldview verification.

Our findings of a positive relationship between BP and perceived discrimination among women who strongly endorsed SJBs and no relationship among women who rejected SJBs are consistent with predictions derived from both theories. Recall, however, that the strong prediction from WVT would be that women who do not endorse SJBs would experience more stress and show increased resting BP when they perceive little discrimination because the absence of discrimination violates their worldview. This prediction is consistent with findings observed in prior research (e.g., Major et al., 2007). Although we did observe negative relationships between perceived discrimination and BP among people who rejected SJBs, the relationships were nonsignificant in both studies.

We believe that the absence of a significant negative relationship among those who did not endorse SJBs may have to do with the nature of the response being studied, specifically, a chronic stress response. Elevated resting BP is often conceptualized as an indicator of exposure to chronic stress. Although individuals who reject SJBs may experience an immediate negative reaction when they do not experience discrimination (due to worldview violation), over time the objective positive valence of nondiscriminatory circumstances and the palliative effects of system justification might outweigh the initially negative response to belief violations.

LIMITATIONS AND FUTURE RESEARCH

There are several limitations to the current research that should be addressed in future investigations. First, the correlational nature of the current studies limits the inferences we can make about our findings. It is unclear whether the variables we measured directly influence each other or whether unmeasured but related variables account for the relationships we observed. Perceived personal discrimination, for example, may be related to a more general tendency to see oneself as a victim. Thus, it is possible that perceptions of victimization, rather than exposure to discrimination, increases blood pressure for individuals who strongly endorse SJBs. This possibility is not incompatible with our overall claim; unfair victimization should also threaten the system and the personal worldviews of individuals who believe that society is just. Future research should test the same hypotheses with longitudinal data in order to better assess causal relationships.

Second, the subset of our sample that we identified as “strong” SJB endorsers scored near the midpoint of the system justification scale. Although we observed a moderate correlation between perceived discrimination and BP for this group, we might expect an even stronger relationship for people who endorse SJBs at higher levels. Nonetheless, it is unsurprising that our participants did not fully endorse

SJBs given that they were students in a liberal college environment where there may be social norms against denying discrimination. Thus, some participants may have been reluctant to fully endorse the SJB scale insofar as it seemed similar to denying discrimination. Furthermore, other measures in the literature are similarly restricted in their distribution. For example, people who have low self-esteem in Western samples typically score at the midpoint of the scale, presumably because there are social norms valuing high self-regard in Western cultures (Heine, Lehman, Markus, & Kitayama, 1999).

Another limitation of the current research is that it is unclear whether people who endorsed the perceived discrimination measure actually experienced a lot of discrimination or were just more likely to interpret ambiguous situations as discriminatory. Thus, individuals who highly endorse SJBs and who report perceiving a great deal of discrimination may experience stress because: (a) they actually encounter a lot of discrimination that cannot be explained in accordance with a just system, or (b) they are less effective at denying discrimination in order to justify the system. Unfortunately, it is difficult to disentangle subjective perceptions of discrimination from objective experiences of discrimination.

An additional limitation of the current research is that our sample consisted of relatively healthy young women. We do not have evidence that women who endorse SJBs and perceive discrimination are hypertensive or face any immediate health risk. We can only conclude that perceived discrimination may take a toll on women who endorse SJBs and could eventually lead to hypertension and heart disease. However, given that our participants were young and healthy, it is notable that we found any differences at all in resting BP. We might expect such differences to be even greater among older people, who may experience a lifetime of discrimination. On the other hand, it is possible that over time individuals develop strategies to cope with discrimination more effectively. If people who endorse SJBs continually experience discrimination, they may eventually alter their worldviews, or they may minimize their perceptions of discrimination, thereby eliminating the added stressors of worldview violation and system threat. Future research should examine the interactions among perceived discrimination, blood pressure, and SJBs for various age groups to explore these possibilities. Furthermore, additional research should also examine these questions for other low status groups in addition to women, such as ethnic minorities.

Finally, another limitation of the current research is that we did not explore the specific mechanisms by which discrimination increases chronic stress among people who strongly endorse SJBs. As discussed earlier, worldview or system threats may produce a high stress load over time because people may experience frequent anxiety and uncertainty, engage in resource-depleting cognitions to bolster the system or their worldview, and have difficulty interpreting situations due to their inconsistent beliefs about system fairness and discrimination (Fazio et al., 1992; Haines & Jost, 2000; Jost, 2001; McCoy & Major, 2007). Future research should examine these possible mechanisms.

CONCLUSION

Discrimination is a stressful experience that may diminish mental and physical health. The current study suggests that people's system-justifying beliefs are an important factor to consider when examining the relationship between discrimination

and stress responses. Our data suggest that perceiving discrimination may be especially stressful for, and potentially more damaging to the physical health of, people who strongly believe that the system is fair and meritocratic.

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